Empirical equations that relate the minimum degree of a faithful complex representation of the monster group whose dimension is 47 × 59 × 71 = 196,883, with parameters of the standard model

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Abstract

In this work, the deep relationship between the monster group and the standard model is once again manifested. This was already manifested in the calculation of the entropy of black holes by proving the E. Witten's conjecture. Some parameters obtained are the mass of the Higgs boson, the value of the Higgs vacuum, the fine-structure constant for zero momentum, and the entropy between the Planck mass and the mass of the electron. Despite being purely empirical equations, their logical consistency is based on the exclusive use of dimensionless parameters of the standard model. This makes us think about its relevance and not coincidence.

The dimension of the monster group, 196883 and its prime divisors, 47,59 and 71; are the basis of these equations

We also think that the monster group plays an essential role in a theory of quantum gravity and even a theory of everything. It is even possible that the 26 exceptional groups are also involved

1 Entropy of the ratio of the Planck mass and the mass of the electron

248, E8 group dimension

$\alpha(0)^{-1} = 137,035999046$ inverse fine structure constant for zero momentum

$$\sqrt{47^2+59^2+71^2} - \ln\ln\ln(248) - \left(\frac{\alpha(0)}{2}\right)^2 = 2\cdot\ln\left(m_{PK}/m_e\right)$$

2 Entropy ratio, Higgs vacuum electron mass

$V_H =$ Higgs vacuum in mass value

$\Omega_b =$ baryon density $= 2\pi \cdot \alpha\,(0)$

$$\sqrt{47+59+71} - \Omega_b + \frac{\alpha\,(0)}{2\pi^2} = \ln\left({}^{V_H \cdot \sqrt[4]{2}}/_{m_e}\right)$$

3 Inverse fine structure constant for zero momentum

$59 \cdot 3 = 47 + 59 + 71$

$$[\pi \cdot \ln(59) + 9] \cdot 2\pi - \frac{1}{3 \cdot (47^2 + 59^2 + 71^2)} - \frac{1}{\sqrt{6} \cdot \pi \cdot 196883} = \alpha(0)^{-1} = 137,03599945886$$

4 Higgs boson mass ratio electron mass

$m_h =$ Higgs boson mass

$e =$ Euler's number

$$\frac{e^e \cdot 196883}{\ln\,(196883)} = \frac{m_h}{m_e}$$

5 Higgs vacuum ratio electron mass

$$\frac{196883 \cdot \ln\,(196883)}{\frac{4\pi}{3}} = \frac{V_H \cdot \sqrt[4]{2}}{m_e}$$

6 Planck mass ratio electron mass

$$\frac{(196883)^{\ln\left[\frac{\alpha(0)^{-1}}{2}\right]}}{1 + \sqrt{\frac{m_e}{m_h}}} = \frac{m_{PK}}{m_e}$$